

Risk Assessment Model

Overview

Risk Management is the practice of balancing the operational and economic costs of protective measures against the likelihood of occurrence and consequence of events detrimental to the achievement of defined goals. All projects contain uncertainty and risk. The process of identifying those risks and planning appropriate responses should they occur is Project Risk Management. Project Risk Management consists of:

- A. Assessing the probability of a risk factor occurring,
- B. Estimating the negative impact should the risk occur, and
- C. Determining the appropriate action to take based on A and B.

Risk assessment is the first step in the risk management methodology. Agencies should use risk assessment to determine the probability of the potential threat and the consequence of its occurrence. Effective risk management is integrated into all SDLC phases.

As a guide for identifying Major Risks in Section 1B, Item 6, of the FY06 ITPR form, the following risk assessment categories and questions are offered.

Scoring / Prioritizing

The following scoring system is offered as a means of determining the appropriate level of response to each risk.

Probability - Each of the following questions can be scored using a standard 1-4 rating system with 1 being the lowest probability and 4 being the highest probability.

Consequence – score each identified risk by the severity of the consequence should it occur. Again, a standard 1-4 rating system can be used with 1 being the lowest level of negative impact to the project and 4 being the highest.

Overall Risk Rating – multiplying the probability rating by the consequence rating will produce an overall risk rating for each question or factor. As a general rule, risks can be summarized based on the total rating as follows:

High Risk – 12-16

Medium Risk – 5-11

Low Risk – 0-5

While an appropriate strategy must be determined for each risk based on its unique characteristics, appropriate responses to identified risks fall into three broad categories:

1. Risk Avoidance – taking action to eliminate the probability of the risk. This category is generally considered when the probability of the risk is high and the consequence is significant, or when the consequence is so significant as to present a fatal threat to the project.

2. Risk Mitigation – planning action to take to minimize the negative impact of the risk should it occur. This category of response is generally considered when the consequence of the risk factor is of medium severity.
3. Risk Acceptance – no action is planned should the risk factor occur. This category of response is generally considered when the consequence of the risk factor is low and does not warrant the cost of potential mitigation or avoidance strategies.

Attachment C presents specific risk mitigation strategies associated with the risk assessment categories and questions.

Risk Assessment Categories

- 1) Strategic Risk
- 2) Financial Risk
- 3) Project Management Risk
- 4) Technology Risk
- 5) Change Management/Operational Risk

Category 1 – Strategic Risk

1. **Question:** To what degree is the project's purpose aligned with the Agency's overall business strategy?

This question assesses the degree of alignment between the project objectives and the Agency's business objectives.

1. Project objectives have been clearly documented and can be linked to specific Agency business objectives.
2. The project direction is consistent with the business strategy but the relationship has not been clearly documented.
3. Project objectives are not clearly related to the business strategy.
4. Some or all project objectives may be in conflict with the stated strategy for the business.

2. **Question:** How clearly are the expected project outcomes defined?

This question is concerned with the way in which project objectives have been set. Vague objectives increase the probability that project outcomes vary from the expectations/input of the project supervisors.

1. Expected outcomes are well defined.
2. Expected outcomes are minimally defined.
3. Overall project outcomes are broadly defined.
4. Outcomes are not clearly defined or contain little detail.

3. **Question:** Have metrics been established to verify the successful completion of each project phase?

This question addresses the need to have a means of measuring project completion. Without these means risk is increased.

1. Metrics have been established for each phase of the project.
2. Metrics have been established for the first phase of the project.
3. Metrics to determine the success of the total project have been established but not specific to a phase.
4. No metrics have been established to ensure successful project completion.

- 4. Question:** To what extent are senior management committed to the project and its outcomes?

The project is at much risk without the commitment from the senior management team.

1. Senior management is fully committed and has openly endorsed the project.
2. Senior management agrees with the need for the project, but it does not represent their highest priority.
3. Senior management does not have a consensus regarding the project.
4. The consensus of senior management is that the project is not warranted

- 5. Question:** How severe would be the result of late delivery?

This question probes the urgency to which the new system is needed to perform the business processes.

1. No noticeable disruption of the business.
2. Some disruption to limited, non-critical areas of the business.
3. Some disruption to critical, time-valued areas of the business.
4. Major disruption to the business because the new system is critical to the core business functions.

Category 2 – Financial Risk

- 1. Question:** What is the end-to-end expenditure that this project will require?

This question assesses the overall financial risk to the State for the entire project (including all phases).

1. Less than \$500 K
2. Between \$500 K and \$1 M
3. Between \$1 M and \$10 M
4. Greater than \$10 M

2. Question: Are the cost/benefits clearly defined with a documented write-up?

This question will gauge the economic feasibility of the project. Without clear financial need for the proposed system, there is a risk that management will not see the need for the project.

1. Yes, a cost/benefit analysis has been performed by a qualified, experienced resource.
2. Yes, a cost/benefit analysis has been performed by an entity not necessarily having experience.
3. Cost/benefits have been informally derived but not clearly documented.
4. No cost/benefit analysis has been performed yet.

3. Question: Is there a clearly defined payback for this system?

This measures the economic justification for a project. Projects with little or no payback often get canceled.

1. There is a clearly defined payback and it is fully justified.
2. There is not a clearly defined payback but the system is necessary regardless (i.e. for public safety, mandated, etc.).
3. There is a payback period but it is not clearly defined.
4. There is neither a payback period nor apparent justification.

4. Question: What is the payback time for the project?

It is necessary to determine if the length of time to pay off the project investment is short enough to justify continuing the project.

1. The payback period is within 2 years.
2. The payback period exceeds 2 years but less than 4 years.
3. The payback period will be greater than 4 years.
4. The payback period has not been quantified.

5. Question: To what degree have existing expenditures met budgeted amounts?

This question will assess the current budget performance to date.

1. Existing expenditures have consistently been within budget amounts.
2. Most expenditures have been within the budget amounts with a small percentage exceeding budget amounts.
3. Some significant expenditures have exceeded budget amounts with others remaining within budget.
4. Existing expenditures have consistently exceeded budget amounts or clear budgets have not yet been established.

- 6. Question:** Is the vendor well established in the business community with a strong financial background?

This question is intended to measure the vendor's viability in the business community.

1. The vendor is well established and in good financial condition.
2. The vendor is well established, but financial condition is unknown.
3. The vendor has been established for less than two years.
4. The vendor is a startup business with little financial history.

Category 3 – Project Management Risk

- 1. Question:** Does the project management team have relevant experience?

This question determines the degree of experience in dealing with similar sized projects.

1. Members of the project management team have experience leading projects of similar size and complexity.
2. Members of the project management team have had exposure to projects of similar size and complexity but not in lead roles.
3. Members of the project management team have had limited exposure to projects of similar size and complexity and generally lack detailed knowledge.
4. Members of the project management team have no experience with projects of similar size and complexity.

- 2. Question:** To what extent has a workplan been developed for the entire project lifecycle?

This question determines if the proper resource levels have been ascertained throughout the whole project.

1. A detailed workplan has been created using an industry accepted methodology and experience from projects of similar size and scope.
2. A workplan has been created using detailed project estimates; but not based on a comparable project.
3. A workplan has been created using general areas of the project lifecycle, but there is not a clear understanding yet of the needed resources.
4. No workplan exists at this time.

- 3. Question:** To what degree have critical checkpoints and milestones been established for this project?

This question determines if established checkpoints have been made for the project. This will allow the project managers to more effectively reach project milestones.

1. Clearly measurable and achievable milestones with firm dates have been created throughout the entire project lifecycle.
2. Milestones, although not clearly measurable, with firm dates have been set for part of the project.
3. Milestones have been created for the project but dates are not firmly set.
4. No milestones or checkpoints exist at this time.

4. Question: What is the total elapsed time of the project from start to finish?

Longer projects typically are at more risk than shorter ones. This is because more influencing factors may be introduced throughout the life of the project.

1. 1 - 6 months
2. 7 - 12 months
3. 13 - 24 months
4. More than 24 months

5. Question: Have scope changes occurred which appear to exert pressure on schedule demands?

This question will determine if the business requirements of the project have recently changed. Any such change can negatively impact the success of the project.

1. No scope changes have occurred.
2. Yes, but only small changes have been made and have been well documented.
3. Yes, significant scope changes have been made and have been well documented.
4. Yes, significant changes have been made and have not been clearly documented.

6. Question: To what degree have 'open issues' been tracked and included as part of ongoing management processes?

This question probes the level of management involvement in day-to-day activities. Issue tracking is important so that unresolved issues do not pose a threat to the success of the project.

1. There is proven method of issue tracking and resolution currently in place and is widely used by all parties.
2. There is a method of issue tracking and resolution currently in place and is generally used by all parties.
3. Open issues are dealt with on an item-by-item basis and are not tracked using a standard method.
4. There is no clear issue tracking or resolution approach in use on the project.

7. Question: Is the project development team organized and deployed to a single location?

The project contains more risk if the development sites are spread out in various locations.

1. All development team members are together with daily interactions with the users.
2. All development team members are co-located but have limited user contact.
3. Development team members are in multiple locations but meet regularly.
4. Development team is located off site and rarely gets together as a whole.

8. Question: To what degree are the development and user skill requirements well defined?

This question explores the level of detail to which skill requirements have been defined.

1. Skill requirements with corresponding time frame requirements have been clearly documented for all phases of the project.
2. Skill requirements have been clearly documented for all phases of the project but do not include corresponding time frame requirements.
3. Skill requirements are loosely defined for the project.
4. Skill requirements are vague or not well defined for the project.

Category 4 – Technology Risk**1. Question:** Is there a plan for ensuring that deliverables meet the need of the users?

This question intends to evaluate whether or not users are sufficiently included in the most important phase, final delivery.

1. There is a plan to ensure that the needs of the users are thoroughly met.
2. The plan for verification of user deliverables is nearly complete.
3. The plan for ensuring user deliverables is in the conceptual phase.
4. There is no plan for ensuring that deliverables meet users needs.

2. Question: Is there a system load test or other measures to ensure good system performance (i.e., measures to test response time, system efficiency, etc.)?

This question measures system performance and the risk associated with failing to measure system performance.

1. There is a load test for system performance in accordance with accepted industry standards.
2. There is a methodology for load testing but some phases are not complete.
3. The load testing plans have been discussed, but are not in place at this time.
4. There are no plans for load testing the system.

3. Question: How thoroughly have the technology options been evaluated?

This question explores how the options for all aspects of the hardware and software environment have been selected.

1. Experienced technical specialists performed a comprehensive evaluation of options using a proven methodology.
2. Experienced technical specialists made recommendations based on prior experiences.
3. Recommendations for technology options were made by key functional personnel.
4. A detailed evaluation has not yet been performed.

4. Question: What is the knowledge of the proposed technology environment?

This question is concerned with the degree of knowledge available to the project team of the chosen hardware and operating system.

1. The proposed platform is well understood by the project team and any technical difficulties that emerge are likely to be handled in house.
2. There are parts of the platform that are very clearly understood, however, aspects of the new platform will be seen for the first time.
3. The platform is not well known to the project team but specialized expertise is readily available from vendors or constituents.
4. The platform is not well known to the project team and specialized expertise is not easily available.

5. Question: Do the key technologies appear to be the appropriate foundation given the system design?

This question assesses the degree to which the chosen technologies will be maintainable and upgradeable.

1. There is every reason to believe that the proposed technology represents a solid foundation for the foreseeable future.
2. Certain components may reach the end of their lifecycle before the system does, but there is a high probability that there will be an upgrade path for replacement.
3. Certain components may reach the end of their lifecycle before the system does and there does not appear to be a logical upgrade path.
4. Various components appear to have reached the end of their lifecycle and more advanced technology exists in the market or technology foundation has yet to be determined.

6. Question: How many existing computer systems must the project system interact with?

This question addresses the number of different computer interfaces, which must be managed in order to complete the project.

1. A limited number of interfaces.
2. A moderate number of interfaces.
3. A large number of interfaces.
4. The number of interfaces is not known.

- 7. Question:** To what extent will the new system enable de-installation of the existing system?

This question will assess the degree to which the proposed system replaces an existing system process.

1. The new system will completely replace an existing system or an existing system does not exist.
2. The new system will be a new layer that will lead to the eventual replacement of an existing system.
3. The new system will be a new layer and there is not a business case for the elimination of any existing systems.
4. The new system will be run in parallel to an existing system.

- 8. Question:** What is the vendor's ability to implement the technology?

This question measures the risk associated with vendor experience or lack of it.

1. The vendor has successfully completed a number of previous implementations.
2. The vendor has successfully completed some previous implementations (1-3).
3. The vendor has limited experience with this technology.
4. The vendor has not previously implemented this technology.

Category 5 – Change Management / Operation Risk

- 1. Question:** How is the acceptance testing plan being developed?

This question explores the assumptions about the way in which testing has been planned and conducted.

1. Acceptance planning is being developed using an industry accepted methodology with comprehensive input from user experts.
2. Acceptance planning is being developed by using an industry accepted methodology with limited input from user experts.
3. Acceptance planning is being developed by using an approach based upon prior experiences but no formal methodology.
4. Acceptance planning has not yet been completed.

2. Question: Is the current operations organization prepared to support the new system?

This question assesses the degree to which the current operations unit can support the new system.

1. Operations has significant experience in managing similar environments and will require little or no training.
2. Operations has experience with similar environments, but will probably require some degree of training.
3. Operations has limited or no experience with the environment and will require extensive training to be effective.
4. Operations does not have the expertise required to manage the operations and new resources will have to be hired or contracted.

3. Question: Is the proposed hardware/software environment in production already within the organization (i.e., mainframe, client server, middleware, etc.)?

This question addresses the additional problems, which might be posed by introducing new and possible unfamiliar facilities as well as a new system

1. The environment is in production and well established.
2. The environment is currently in use in production but not well established and subject to changes.
3. The environment is currently in use for development efforts but has not yet been established in production.
4. Hardware/software environment is not currently in use.

4. Question: How clearly defined are the system operating procedures (backups, restart/recovery, etc.)?

This question evaluates the thoroughness of system documentation for maintenance purposes.

1. Well defined with easy, well documented, legible procedures.
2. Maintenance procedures exist and some documentation exists.
3. Maintenance procedures exist but documentation is limited.
4. System maintenance procedures are not clearly defined or documented.

5. Question: How severely would business be impacted by a system failure?

This question probes the reliance, which the business will place upon the system when it is operational.

1. Minimal impact- system is not critical to daily business functions.
2. Moderate impact - system is critical to business, but a well documented, automated contingency approach exists.

3. Significant impact - system is critical to the business and contingency plan relies on work-around.
4. Severe impact - system is critical to the business and there is no well documented contingency plan.

6. Question: What will be the magnitude of change that the new system will impose upon the users?

This question will determine how much change the system will inflict upon the organization. The more change a project brings to the organization the less likely people are willing to accept it.

1. The new system will impose very little change, if any, upon the users.
2. The new system will change slightly the current daily operations of the users.
3. The new system will require significant changes by the users and will require training.
4. The new system will present an entirely new way for the users to complete daily operations.

7. Question: Is department staff willing to accept this change?

This question determines if the staff is positive and committed to accepting the new system.

1. Staff is well informed about the change and show strong enthusiasm.
2. Probably, staff seems enthusiastic but there has been no formal evaluation of their enthusiasm or detailed knowledge of the change.
3. Unclear, only limited or informal feedback from staff has been received.
4. No, firsthand feedback clearly indicates reluctance to the change.

8. Question: Will staff numbers be reduced as a result of implementing the system?

This question determines if employees will be threatened by the new system. If so, risk of users not accepting the system increases.

1. There will not be a reduction in staff as a result of the new system.
2. A small number of reductions is expected to isolated areas of the organization.
3. Numerous reductions are expected to several levels of the organization.
4. Staffing projections have not been completed.

9. Question: Will multiple business organization units be affected by the new system?

This question will determine the number of business units that will be affected by the new system. The more business units involved, the increased risk of the project.

1. There will only be one business organization affected.
2. Multiple business units within the same Agency will be affected.
3. Multiple business units in several Agencies will be affected.
4. Multiple business units across several levels of state government (e.g. state, county, local) will be affected.

10. Question: To what degree are changes to the current business processes being managed?

This question assesses how well changes to current process have been planned.

1. There is a well documented plan in place for the redesign of the changed processes with a detailed rollout schedule.
2. There is a well documented plan in place for the redesign of the changed processes but a detailed rollout schedule has not yet been developed.
3. New process changes have been considered but are not clearly defined and documented.
4. Process changes have not yet been considered.

11. Question: What is the level of user involvement in the project?

This question measures the level of user involvement with the notion that less user involvement increases risk of success.

1. The users are involved and have a permanent presence on the project team.
2. The users are available for consultation and to provide functional advice.
3. The users are minimally engaged on the project and clarification of requirements is difficult.
4. The users are not involved in the project.